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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/842,477	04/25/2001	Frederick S.M. Herz		7916

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EXAMINER	
WINDER, PATRICE L	

ART UNIT	PAPER NUMBER
2145	

DATE MAILED: 05/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 09/842,477	**Applicant(s)** HERZ ET AL.	
	Examiner Patrice Winder	**Art Unit** 2145	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 22 March 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☒ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: 2-5.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☒ Other: see Katherine Gho's homepage.

Patrice L. Winder

Patrice Winder
Primary Examiner
Art Unit: 2145

Continuation of 3. NOTE: Including "caching" is a change in scope and would require further search and consideration.

Continuation of 11. does NOT place the application in condition for allowance because: the originally filed claims included a "bounded interval" when the current claims of the applicant were presented the "bounded interval" was not included. Thus, applicant changed the "scope" of the claims. Hofmann is a Technical Report made publicly available by Bell Labs in 1999. The authors and the technical community treat Hofmann as a publicly available Technical Report.

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Research Interests

The main interests of my research are in networking and distributed systems. I have worked extensively on content distribution network design, streaming web cache design, network support for distributed gaming, 3G wireless network architecture and scalability issues in group communication. Currently I am working on QoS provisioning and carrier grade VoIP provisioning in 3G wireless networks.

Current Projects

- **QoS Support for Carrier Grade VoIP in 3G Wireless Networks:** As service providers roll out VoIP service for broadband access networks, the race to deploy VoIP in 3G wireless networks is heating up. There is an urgent need to provide QoS guarantees for VoIP over a EV-DO network by addressing throughput, delay, loss, handoff and capacity issues so that high-quality carrier grade VoIP can be realized. Provision of end-to-end QoS includes devising mechanisms for providing QoS guarantees over **a)** the air interface, **b)** the Radio Access Network (RAN) and **c)** the core network. This project focuses on QoS provisioning over the RAN and the interaction between the RAN and the IP Multimedia Subsystem **(IMS)** to enforce QoS policies.

- **End-to-End QoS in 3G Wireless Networks:** As the usage of wireless packet data services increases, wireless carriers today are faced with the challenge of offering multimedia applications within current 3G data networks. Wireless carriers need to support applications with a variety of QoS needs along with multiple classes of subscribers while efficiently utilizing their precious wireless bandwidth. Our goal is to support QoS within the IP Multimedia System **(IMS)** architecture defined in 3GPP and 3GPP2, with modifications to application-/transport-/network-/link-layer protocols, and scheduling algorithms in Radio Access Network (RAN). QoS provisioning in RAN requires signaling in the control plane and resource allocation in the data plane. In the control plane, Session Initiation Protocol (SIP) with QoS argumentation is required. In the data plane, Generic Routing Encapsulation (GRE) and Radio Link Protocol (RLP) sessions need to be modified. We propose and build a prototype for a CDMA2000 standard compliant, end-to-end QoS architecture in the IMS framework. The overview of this project is in Providing End-to-End QoS for Multimedia Applications in 3G Wireless Networks, *in Proceedings of the* ***SPIE*** *Information Technologies and Communications* ***(ITCom'2003)*** *Conference on Internet Multimedia*

Management Systems, September 2003, (K. Guo, S. Rangarajan, A. Siddiqui, and S. Paul). The details of QoS signaling using SIP is in End-to-End QoS Support for SIP Sessions in CDMA2000 Networks, Bell Labs Technical Journal, Vol. 9, No. 3, November 2004, (M. Siddiqui, K. Guo, S. Rangarajan and S. Paul).

- **Multimedia MiRingBack (MmRB) Service:** With the saturation of revenue from voice services, the telecom operators are feeling the pressure to introduce new services to increase the average revenue per user. Customized ring-back is one of the services that is gaining momentum across the globe. The service enables the subscriber (i.e., the called party) to provide customized ring-back tone to a calling party, as provisioned by the subscriber in his/her profile, maintained in a network element that provides the service. Lucent's current product offer to meet the needs of prevailing deployed networks is called MiRingBack (MRB) service. This project takes the existing MRB service to the next level by bringing multimedia capability in broadband IP networks and 3G wireless networks to MRB whereby customized audio/video/text/image can be rendered on the calling party's phone.

- **Enabling Always-On Services:** With the popularity of services like Push-to-Talk, the need for "always-on" services is becoming important for service providers. We define a service to be "always-on" if (i) Network can reach an end-user instantly at any time regardless of the user's location, (ii) User can access the service instantly, and once connected receives desired quality of service and improved experience. The goal of this project is to build intelligence into Lucent's Network Platforms to enable "always-on" services. Under the long-term scope of the project, we are developing a content and application distribution overlay network that can provide a common platform to enable "always-on" into multiple "push-to-X" applications. As a short-term project, we selected two existing Lucent applications, namely **MiRingBack (MRB)** and **MiVideoPortal (MVP)** and enable "always-on" into them. The MRB service is an example of network pushing content to the user whereby the subscriber can provide customized ringback tone to a caller, based on called party's (i.e., subscriber's) provisionable screening criteria. The MVP service provides a portal located within the service provider network that enables users at mobile terminals to access particular streaming video content and then have it streamed to their handsets for viewing.

Past Projects

- **Distributed Gaming:** Real-time, online multi-player games are becoming increasingly popular due to advances in game design and the proliferation of broadband Internet access. However, fairness remains a major challenge when players over large geographic areas participate in a client-server based game together. We proposed a game-independent, network-based framework for services that balance the trade-off between response time and fairness. Specifically, we proposed message delivery algorithms that remove the unfair advantage that players with smaller message delays from the game server receive over players with large message delays from the server. We first proposed the Sync-MS algorithm as described in Sync-MS: Synchronized Messaging Service for Real-Time Multi-Player Distributed Games, *in Proceedings of IEEE International Conference on Network Protocols* ***(ICNP'2002)***, Nov 2002, (Y. Lin, K. Guo and S. Paul). As a further improvement, we extended the framework to be more general such that it does not require assumptions of synchronized clocks at the players and servers; neither does it require a mechanism to compute the one-way delay from the players to the server accurately. The details can be found in A Fair Message Exchange Framework for Distributed Multi-Player Games, *in Proceedings of the Second Workshop on Network and System Support for Games* ***(NetGames'2003),*** May 2003, (K. Guo, S. Mukherjee, S. Rangarajan, and S. Paul).

- **Lucent IMMINET WebCache S Product Line:** This project focuses on the design and implementation of a web cache for streaming media in content distribution networks (CDN). The WebCache S appliance interoperates with RealNetwork' RealServer, Microsoft's Windows Media Server and Apple's QuickTime Server, the three dominate streaming servers on the market. The streaming cache design incorporates novel mechanisms to reduce network congestion, server load, and client's access delay.

- **Streaming Protocols and Proxies:** We have extensively worked in the area of network support for streaming applications, especially in the design and implementation of streaming proxy caches, and scalable streaming distribution systems. In streaming cache design, we proposed novel mechanisms in streaming cache design to reduce network congestion, server load, and client's access delay. We built a prototype system to demonstrate the benefits of these mechanisms. This work is captured in Design and Implementation of a Caching System for Streaming Media over the Internet, *in Proceedings of the Sixth IEEE Real-Time Technology and Applications Symposium **(RTAS'2000)***, May 2000, (E. Bommaiah, K. Guo, M. Hofmann and S. Paul). After studying a single cache, we further investigated how a system of distributed streaming caches would function. Specifically, we proposed data layout and replacement algorithms for distributed streaming caches in the Internet or Akamai-style data centers, in order to optimize storage usage, playback startup latency, playback switch-over latencies, and account for clip popularity. We designed (1) new data layout schemes: Randomized Caching (**RCache**) and **Silo** layouts, (2) a global data replacement scheme using **Tokens** to minimize inter-cache traffic for state exchange, and (3) a local cache replacement scheme **Rainbow** that uses a concept of "segment caching potential". We conducted a detailed simulation study and developed an analytical model that is verified by our simulation results. Papers that captured this work are Silo, Rainbow, and Caching Token: Schemes for Scalable Fault Tolerant Stream Caching, *IEEE Journal on Selected Areas in Communications (JSAC) on Internet Proxy Services,* September 2002, (Y. Chae, K. Guo, M. Buddhikot, S. Suri and E. Zegura) and RCache: Design and Analysis of Scalable Fault Tolerant Multimedia Stream Caching Schemes, *in Proceedings of SPIE Information Technologies and Communications **(ITCom'2001)** Conference on Scalability and Traffic Control in IP Networks,* August 2001, (K. Guo, M. Buddhikot, Y. Chae, and S. Suri). In terms of designing streaming distribution systems, we proposed a closed-loop approach towards video-on-demand service in an environment where broadband streaming caches are provided near the users. We proposed two adaptive techniques called Multicast with Caching (**Mcache**) and Segmented Multicast with Caching (**SMcache**), that use prefix caches to provide zero-delay video-on-demand service. Extensive simulation was conducted to evaluate these techniques. The details are described in Multicast with Cache (MCache): An Adaptive Zero Delay Video-on-Demand Service, *in IEEE Transactions of Circuits and Systems for Video Technology,* Vol 11, Issue 3, March 2001, pp.440-456. (S. Ramesh I. Rhee, and K. Guo).

Journal Publications

1. Routing Bandwidth Guaranteed Paths with Local Restoration in Label Switched Networks, *IEEE Journal on Selected Areas in Communications **(JSAC)** Special Issue on Intelligent Services and Applications in Next Generation Networks,* Jan 2005, (with L. Li, M. Buddhikot, and C. Chekuri)
2. End-to-End QoS Support for SIP Sessions in CDMA2000 Networks, *Bell Labs Technical Journal (BLTJ),* Vol. 9, No. 3, November 2004, (with M. Siddiqui, S. Rangarajan and S. Paul). (pdf)
3. Scalable Stability Detection Using Logical Hypercube, *IEEE Transactions on Parallel and Distributed Systems*, Vol. 13, No. 9, September 2002, (with R. Friedman and S. Manor). (ps, pdf)
4. Silo, Rainbow, and Caching Token: Schemes for Scalable Fault Tolerant Stream Caching, *IEEE Journal on Selected Areas in Communications **(JSAC)** on Internet Proxy Services,* September 2002, (with Y. Chae, M. Buddhikot, S. Suri and E. Zegura). (ps, pdf)
5. Multicast with Cache (MCache): An Adaptive Zero Delay Video-on-Demand Service, *in IEEE Transactions of Circuits and Systems for Video Technology,* Vol 11, Issue 3, March 2001, pp.440-456. (with S. Ramesh and I. Rhee). (ps, pdf)
6. A Dynamic Light-Weight Group Service, *in Journal of Parallel and Distributed Computing*, Vol 60, pp. 1449-1479, December 2000, (with L. Rodrigues, P. Verissimo and K. Birman). (ps, pdf)

Conference Publications

1. Optimal Customer Provisioning in Network-Based Mobile VPNs, *in Proceedings of the 1st Annual International Conference on Mobile and Ubiquitous Systems: Networking and Services* ***(MobiQuitous 2004),*** Aug 22-26, 2004, (with S. Mukherjee, S. Rangarajan and S. Paul). (ps, pdf)
2. Providing End-to-End QoS for Multimedia Applications in 3G Wireless Networks, *in Proceedings of the* ***SPIE*** *Information Technologies and Communications* ***(ITCom'2003)*** *Conference on Internet Multimedia Management Systems,* September 2003, (with S. Rangarajan, A. Siddiqui, and S. Paul). (ps, pdf)
3. A Fair Message Exchange Framework for Distributed Multi-Player Games, *in Proceedings of the Second Workshop on Network and System Support for Games* ***(NetGames'2003),*** May 2003, (with S. Mukherjee, S. Rangarajan, and S. Paul). (ps, pdf)
4. Sync-MS: Synchronized Messaging Service for Real-Time Multi-Player Distributed Games, *in Proceedings of IEEE International Conference on Network Protocols* ***(ICNP'2002),*** November 2002, (with Y. Lin and S. Paul). (ps, pdf)
5. Routing Bandwidth Guaranteed Paths with Local Restoration in Label Switched Networks, *in Proceedings of IEEE International Conference on Network Protocols* ***(ICNP'2002),*** November 2002, (with L. Li, M. Buddhikot, and C. Chekuri). (ps, pdf)
6. RCache: Design and Analysis of Scalable Fault Tolerant Multimedia Stream Caching Schemes, *in Proceedings of SPIE Information Technologies and Communications* ***(ITCom'2001)*** *Conference on Scalability and Traffic Control in IP Networks,* August 2001, (with M. Buddhikot, Y. Chae, and S. Suri). (ps, pdf)
7. Multicast with Cache (MCache): An Adaptive Zero Delay Video-on-Demand Service, *in Proceedings of IEEE* ***INFOCOM'2001***, April 2001, (with S. Ramesh and I. Rhee). (ps, pdf)
8. Design and Implementation of a Caching System for Streaming Media over the Internet, *in Proceedings of the Sixth IEEE Real-Time Technology and Applications Symposium* ***(RTAS'2000),*** May 2000, (with E. Bommaiah, M. Hofmann and S. Paul) (ps, pdf), (slides: pdf).
9. Partitionable Light-Weight Groups, *in Proceedings of the 20th IEEE International Conference on Distributed Computing Systems* ***(ICDCS'2000),*** April 2000, (with L. Rodrigues). (ps, pdf)
10. Message Stability Detection for Reliable Multicast, *in Proceedings of IEEE* ***INFOCOM'2000,*** March 2000, (with I. Rhee) (ps, pdf) (slides: pdf).
11. Scalable Stability Detection Using Logical Hypercube, *in Proceedings of 18th IEEE Symposium on Reliable Distributed Systems* ***(SRDS'1999),*** October 1999, (with R. Friedman and S. Manor). (ps, pdf)
12. Proposal for Collecting Access Statistics for Continues Media Access on the WWW, ***W3C Workshop*** *on Web Characterization*, December 1998, (with M. Hofmann and S. Paul).
13. Scalability of the Microsoft Cluster Service, *in Proceedings of the second* ***USENIX*** *Windows NT Symposium,* August 1998, (with W. Vogels, D. Dumitriu, A. Agrawal and T. Chia).
14. Moving the Ensemble Groupware System to Windows NT and Wolfpack, *in Proceedings of* ***USENIX*** *Windows NT Workshop*, August 1997, (with K. Birman, W. Vogels, M. Hayden, T. Hickey, R. Friedman, S. Maffeis, R. van Renesse and A.Vaysburd).
15. Dynamic Light-Weight Groups, *in Proceedings of the 17th IEEE International Conference on Distributed Computing Systems (ICDCS'1997), pages 33-42.* Baltimore, Maryland, USA, May 1997, (with L. Rodrigues) (ps, pdf) (slides: ps, pdf).
16. A Transparent Light-Weight Group Service, *in Proceedings of the 15th IEEE Symposium on Reliable Distributed Systems (SRDS'1996), pages 130-139.* Niagara-on-the-Lake, Canada, October 1996, (with L. Rodrigues, A. Sargento, R. van Renesse, B. Glade, P. Verisimo and K. Birman) (ps, pdf) (slides: ps, pdf).
17. Structured Virtual Synchrony: Exploring the Bounds of Virtually Synchronous Group

Communication, *in Proceedings of the 7th ACM SIGOPS European Workshop*, Connemara, Ireland, September 1996, (with W. Vogels and R. van Renesse). (ps, pdf)

Technical Reports

1. Bandwidth Guaranteed Provisioning in Network-Based Mobile VPNs, K. Guo, S. Mukherjee, S. Rangarajan, and S. Paul, *Bell Labs Technical Memorandum BL10009670-030829-02TM*, August 2003.
2. Optimal Customer Provisioning in Network-Based Mobile VPNs, K. Guo, S. Mukherjee, S. Paul, and S. Rangarajan, *Bell Labs Technical Memorandum BL 10009670-030731-01TM*, July 2003.
3. Provisioning Network-Based Mobile VPNs. *Bell Labs Technical Memorandum BL10009670-021023-15TM*, October 2002, (with L. Li, S. Mukherjee, and S. Paul)
4. Analysis of Distributed Data Placement and Replacement Schemes for Cluster Based Streaming Caches, *Bell Labs Technical Memorandum BL1009670-001017-04TM,* October 2000, (with Y. Chae and M. Buddhikot).
5. Caching Silos and Tokens: Novel Schemes for Data Layout and Replacement in Distributed Streaming Caches over the Internet, *Bell Labs Technical Memorandum BL1009670-001017-03TM,* October 2000, (with M. Buddhikot, S. Suri and Y. Chae).
6. Design and Implementation of a Caching System for Streaming Media over the Internet, *Bell Labs Technical Memorandum BL011345-990628-05TM,* June 1999, (with E. Bommaiah, M. Hofmann and S. Paul).
7. Caching Techniques for Streaming Multimedia over the Internet, *Bell Labs Technical Memorandum BL011345-990409-04TM,* April 1999, (with M. Hofmann, E. Ng, S. Paul and H. Zhang) (ps, pdf)
8. GSGC: An Efficient Gossip-Style Garbage Collection Scheme for Scalable Reliable Multicast, *Computer Science Technical Report CS-TR 97-1656*, Department of Computer Science, Cornell University, December 1997, (with M. Hayden, R. van Renesse, W. Vogels and K. Birman). (ps, pdf)
9. Hierarchical Message Stability Tracking Protocols, *Computer Science Technical Report CS-TR 97-1647,* Department of Computer Science, Cornell University, September 1997, (with R. van Renesse, W. Vogels and K. Birman). (ps, pdf)
10. Dynamic Light-Weight Groups, *Computer Science Technical Report CS-TR 96-1612,* Department of Computer Science, Cornell University, October 1996, (with L. Rodrigues). (ps, pdf)
11. A Dynamic Light-Weight Group Service, *Computer Science Technical Report CS-TR 96-1611,* Department of Computer Science, Cornell University, October 1996, (with L. Rodrigues, A. Sargento, R, van Renesse, B. Glade, P. Verissimo and K. Birman). (ps, pdf)
12. A Transparent Light-Weight Group Service, *Computer Science Technical Report CS-TR 96-1585,* Department of Computer Science, Cornell University, May 1996, (with L. Rodrigues, A. Sargento, R, van Renesse, B. Glade, P. Verissimo and K. Birman). (ps, pdf)
13. Horus: A Flexible Group Communications System, *Computer Science Technical Report CS-TR 95-1500,* Department of Computer Science, Cornell University, March 1995, (with R. van Renesse, K. P. Birman, B. Glade, M. Hayden, T. Hickey, D. Malki, A. Vaysburd and W. Vogels) (ps, pdf)

Patent Issued

1. Method For Streaming Multimedia Information Over Public Networks, U.S. Patent Number 6708213, Issued on March 16, 2004.

2. High Quality Streaming Multimedia, US Patent Number 6377972, Issued on April 23, 2002.

Education

Ph.D. in Computer Science from Cornell University, Ithaca, NY, 1998 - Advisor: Ken Birman
Dissertation: Scalable Message Stability Detection Protocols (ps, pdf)
M.S. in Computer Science from Cornell University, Ithaca, NY, 1995.

B.S. in Computer Science and B.A. in Mathematics from University of Texas at Austin, 1992.

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